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**FLUOR**

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**Memorandum**

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To: S. J. Trent E6-35 Date: M4W41-SLF-07-204  
April 13, 2007

From: S. L. Fitzgerald, Manager *[Signature]*  
WSCF Analytical Chemistry

cc: w/Attachments  
T. F. Dale S3-30 J. E. Trechter S3-30  
H. K. Meznarich S3-30 D. D. Wright S3-30  
P. D. Mix S3-30 File/LB

Subject: FINAL RESULTS FOR UR-1 OPERABLE UNIT AUGER/SURFICIAL QC SAMPLE -  
SAMPLE DELIVERY GROUP WSCF20070517 - SAF NUMBER F07-031

Reference: (1) Groundwater Protection Program-Letter of Instruction, FH-EIS-2003-MEM-001,  
October 31, 2002

(2) HNF-SD-CD-QAPP-017, Rev. 8, Waste Sampling & Characterization Facility Quality  
Assurance Plan

This letter contains the following information for sample delivery group WSCF20070517:

1. Cover Sheet (Attachment 1)
2. Narrative (Attachment 2)
3. Analytical Results (Attachment 3)
4. Sample Receipt Information (Attachment 4)

SLF/grf

Attachments 4

**RECEIVED**  
MAY 01 2007  
**EDMC**



M4W41-SLF-07-204

ATTACHMENT 1

**COVER SHEET**

Consisting of 2 pages  
Including cover page

## WSCF SAF NUMBER CROSS REFERENCE

Group#: WSCF20070517  
Data Deliverable Date: 11-may-2007  
Data Deliverable: Cover Sheet

SAF#	Sample ID	WSCF#	Matrix
F07-031	B1MW26	W07GR00597	WATER

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ATTACHMENT 2

**NARRATIVE**

Consisting of 3 pages  
Including cover page

Sample Delivery Group	WSCF20070517
Sample Matrix	WATER
Sample Visual	N/A
SAF Number	F07-031
Data Deliverable	Summary Report

### Introduction

One UR-1 Operable Unit Auger/Surficial QC sample was received at the WSCF Laboratory on March 27, 2007. The sample was analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Groundwater Remediation Program (GRP) – Letter of Instruction*, referenced in the cover letter.

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 3) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information. Copies of the chain of custody and sample receipt documentation are included as Attachment 4.

### Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report*, page 11, for a complete listing of approved analytical methods.

### Radiochemistry Comments

**Rad Chem** – There are no hold times associated with WSCF's radiochemical methods. A Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. See pages 13 through 14 for QC details.

All QC controls are within established laboratory limits.

This Summary Report is in compliance with the SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the WSCF Laboratory Analytical Manager and Client Services, as verified by the following signature.



Pauline D. Mix  
WSCF Client Services

#### Abbreviations

Hg – mercury

IC – ion chromatography

ICP – inductively coupled plasma

ICP/AES – ICP/atomic emission spectroscopy

ICP/MS – ICP/mass spectrometry

Total U – total uranium

AT/TB – total alpha/total beta

AEA – Alpha Energy Analysis

WTPH-G – Total Hydrocarbons-Gasoline

Am – americium

Cm – curium

Pu – plutonium

Np – neptunium

GEA – gamma energy analysis

H3 – Tritium

Sr – Strontium 89, 90

WTPH-D – Total Hydrocarbons-Diesel

TSS – Total Suspended Solids

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ATTACHMENT 3

**ANALYTICAL RESULTS**

Consisting of 7 pages  
Including cover page

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ATTACHMENT 4

**SAMPLE RECEIPT INFORMATION**

Consisting of 3 pages  
Including cover page



# WSCF ANALYTICAL RESULTS REPORT

for

Groundwater Remediation Program

Richland, WA 99354

Attention: Steve Trent

Analytical:

*[Signature]* S. Fitzgerald 4/18/07

Client Services:

*[Signature]* P.D. Mix 4/12/2007

*All results are reported on an "as received" basis unless otherwise noted in the comment section.*

This information is intended for the use of the addressee only. If the reader of this report is not the intended recipient or is not authorized by the recipient to receive the report, you are hereby notified that any dissemination, distribution or copying of this report is strictly prohibited. If you have received this report in error, please notify WSCF Laboratory immediately by telephone at (509) 373-7020 or (509) 531-8004. Information designation of this report is the responsibility of the customer.

Contract#: FH-EIS-2003-MEM-001  
Report#: WSCF20070517  
Report Date: 12-apr-2007  
Report WGPP/ver. 5.2

Groundwater Remediation Program

Page 1

## W13q Worklist/Batch/QC Report for Group# WSCF20070517

WL#	S#	Batch	QC#	Tray Type	Sample#	Test
31346	1	31723	35919	BLANK		Gamma Energy Analysis-grd H2O
31346	2	31723	35919	LCS		Gamma Energy Analysis-grd H2O
31346	3	31723	35919	DUP	W07GR00597	Gamma Energy Analysis-grd H2O
31346	4	31723	35919	SAMPLE	W07GR00597	Gamma Energy Analysis-grd H2O
31421	1	31797	35948	BLANK		Strontium 89/90
31421	2	31797	35948	LCS		Strontium 89/90
31421	3	31797	35948	DUP	W07GR00580	Strontium 89/90
31421	12	31797	35948	SAMPLE	W07GR00597	Strontium 89/90
31421	13	31797	35948	SURR	W07GR00597	Strontium 89/90

# WSCF

## METHOD REFERENCES REPORT

Department: Radiochemistry

The results provided in this report were generated using the following WSCF Laboratory procedures. For your convenience, this table provides a listing of the regulatory or industry methods that are referenced by each of these WSCF procedures. Please note that the most recent version of the regulatory or industry method is listed here even though the WSCF procedure may reference an older version of the method. Also, a reference to a regulatory or industry method here does not necessarily indicate a verbatim implementation of that method.

LA-508-415	LA-508-415: OPERATION OF THE PROTEAN 2-INCH ALPHA/BETA COUNTING SYSTEM FOR GROSS	
	HEIS ALPHA_GPC	GROSS ALPHA GPC
	HEIS BETA_GPC	GROSS BETA GPC
	HEIS SRTOT_SEP_PRECIP_GPC	Plutonium 89/90
LA-508-481	LA-508-481: GAMMA ENERGY ANALYSIS USING PROCOUNT SOFTWARE	
	HEIS GAMMA_GS	Gamma Emmision Spectrometry

Note: A complete list of WSCF analytical procedures and referenced regulatory or industry methods is available online at <http://www2.rl.gov/phmc/as-dol>.

Report Date: 12-apr-2007

Report#: WSCF20070517

Report WGPPM/5.2

Page 1

# WSCF ANALYTICAL RESULTS REPORT

**Attention:** Steve Trent  
**SAF Number:** F07-031  
**Sample #** W07GR00597  
**Client ID:** B1MW26

TRENT  
WSCF

**Matrix:** WATER

**Group #:** WSCF20070517  
**Department:** Radiochemistry  
**Sampled:** 03/27/07  
**Received:** 03/27/07

Test Performed	CAS #	Method	RQ	Result	Unit	TP Err	Unit	DF	MDL	PQL	Analysis Date
<b>Gamma Energy Analysis-grd H2O</b>											
Cesium-137	10045-97-3	LA-508-481	U	-5.56	pCi/L	+ -5.56	pCi/L	1.00	6.8		04/02/07
<b>Strontium 89/90</b>											
Strontium-89/90	SR-RAD	LA-508-415	U	-4.60	pCi/L	+ -4.60	pCi/L	1.00	3.0		04/04/07
Sr-85 Tracer by Beta Counting	SR85	LA-508-415		90.2	Percent			1.00	0.0		04/04/07

**MDL=Minimum Detection Limit**

**RQ=Result Qualifier**

**TP Err=Total Propagated Error**

**DF=Dilution Factor**

U - Analyzed for but not detected above limiting criteria(inorg)

\* - Indicates results that have NOT been validated; + - Indicates more than six qualifier symbols

Report WGPP/ver. 5.2

Groundwater Remediation Program

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20070517  
Matrix: WATER  
Test: Gamma Energy Analysis-grd H2O

Sample Date: 03/27/07  
Receive Date: 03/27/07

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
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Lab ID: W07GR00597  
BATCH QC ASSOCIATED WITH SAMPLE

DUP	Cesium-137	10045-97-3	U-5.384		RPD			n/a	20.000		04/02/07
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BATCH QC

BLANK	Cesium-137	10045-97-3	U6.104	n/a	pCi/L	-10.000	1000.000				04/02/07
LCS	Cesium-137	10045-97-3	4119	115.056	% Recov	80.000	120.000				04/03/07

# WSCF ANALYTICAL LABORATORY QC REPORT

Department: Radiochemistry

SDG Number: WSCF20070517

Matrix: WATER

Test: Strontium 89/90

Sample Date: 03/27/07

Receive Date: 03/27/07

QC Type	Analyte	CAS #	QC Found	QC Yield	Units	Lower Limit	Upper Limit	RPD(%)	RPD Limit	RQ	Analysis Date
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Lab ID: W07GR00580

BATCH QC ASSOCIATED WITH SAMPLE

DUP	Sr-85 Tracer by Beta Counting	SR85	81.8	81.800	% Recov	30.000	105.000				04/04/07
DUP	Strontium-89/90	SR-RAD	2.6E+03		RPD			0.000	20.000		04/04/07

Lab ID: W07GR00597

BATCH QC ASSOCIATED WITH SAMPLE

SURR	Sr-85 Tracer by Beta Counting	SR85	90.2	90.200	% Recov	30.000	105.000				04/04/07
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BATCH QC

BLANK	Sr-85 Tracer by Beta Counting	SR85	86.4	86.400	% Recov	30.000	105.000				04/04/07
BLANK	Strontium-89/90	10098-97-2	U-1.1	n/a	pCi/L	-10.000	100.000				04/04/07
LCS	Sr-85 Tracer by Beta Counting	SR85	88.9	88.900	% Recov	30.000	105.000				04/04/07
LCS	Strontium-89/90	10098-97-2	616.0	107.538	% Recov	80.000	120.000				04/04/07

Waste Sampling and Characterization Facility  
P.O. BOX 1970 S3-30, Richland, WA 99352  
PHONE: (509) 373-7004/FAX: (509) 373-7134

5/11/07

ACKNOWLEDGMENT OF SAMPLES RECEIVED

5/10/07 KOS

Groundwater Remediation Program

Richland, WA 99354  
Attn: Steve Trent

Customer Code: GPP  
PO#: 121640/ES10  
Group#: 20070517  
Project#: F07-031  
Proj Mgr: Steve Trent A0-21  
Phone: 373-5869

The following samples were received from you on 03/27/07. They have been scheduled for the tests listed beside each sample. If this information is incorrect, please contact your service representative. Thank you for using Waste Sampling and Characterization Facility.

Sample#	Sample Id	Tests Scheduled	Matrix	Sample Date
W07GR00597	B1MW26	TRENT @GEA-GPP @SR89_90	Water	03/27/07

Test Acronym Description

Test Acronym	Description
@GEA-GPP	Gamma Energy Analysis-grd H2O
@SR89_90	Strontium 89/90

<b>COLLECTOR</b> <i>Larman Wise</i>		<b>COMPANY CONTACT</b> TRENT, SJ		<b>TELEPHONE NO.</b> 373-5869		<b>PROJECT COORDINATOR</b> TRENT, SJ		<b>PRICE CODE</b> 7N		<b>DATA TURNAROUND</b> 45 Days / 45 Days		
<b>SAMPLING LOCATION</b> I-EB-3 <i>C5620</i>		<b>PROJECT DESIGNATION</b> UR-1 Operable Unit Auger and Surficial Sampling - QC Sampling				<b>SAF NO.</b> F07-031		<b>AIR QUALITY</b> <input type="checkbox"/>				
<b>ICE CHEST NO.</b>		<b>FIELD LOGBOOK NO.</b>		<b>COA</b> 121640ES10		<b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE						
<b>SHIPPED TO</b> Waste Sampling & Characterization		<b>OFFSITE PROPERTY NO.</b> N/A				<b>BILL OF LADING/AIR BILL NO.</b> N/A						
<b>MATRIX*</b> A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)		<b>PRESERVATION</b>		HN03 to pH <2	HN03 to pH <2						
			<b>TYPE OF CONTAINER</b>		Square Bottle - Poly	G/P						
			<b>NO. OF CONTAINER(S)</b>		1	1						
			<b>VOLUME</b>		500mL	1L						
	<b>SPECIAL HANDLING AND/OR STORAGE</b> <i>20070517</i>		<b>SAMPLE ANALYSIS</b>		Gamma Spectroscopy (Cesium-137)	Strontium-89,90 -- Total Sr						

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME								
B1MW26	WATER	03-27-07	1255	✓	1255						
<i>W07G800597</i>											

<b>CHAIN OF POSSESSION</b>			<b>SIGN/ PRINT NAMES</b>		<b>SPECIAL INSTRUCTIONS</b>	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	<div style="border: 2px solid black; padding: 10px; text-align: center; margin: 10px auto; width: 150px;"> <b>ICED</b>  Initial  Date </div>		
<i>W.M. Wise</i>	<i>3-27-07 1430</i>	<i>B.C. R...</i>	<i>3-27-07</i>			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME			
<i>W.M. Wise</i>	<i>3-27-07 1450</i>	<i>TA R...</i>	<i>3-27-07 1450</i>			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME			

<b>LABORATORY SECTION</b>	RECEIVED BY	TITLE	DATE/TIME
<b>FINAL SAMPLE DISPOSITION</b>	DISPOSAL METHOD	DISPOSED BY	DATE/TIME